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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,637	02/05/2004	Kazuhiro Takeshita	248613US0SPDIV	4119

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ALEXANDRIA, VA 22314

EXAMINER
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JOLLEY, KIRSTEN

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 06/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/771,637	Applicant(s) TAKESHITA ET AL.	
	Examiner Kirsten C. Jolley	Art Unit 1762	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 April 2006.  
 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10, 13-16, 19-23, 26-29 and 32-41 is/are pending in the application.  
     4a) Of the above claim(s) 13-16, 19-23, 26-29 and 32-41 is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-10 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☒ Certified copies of the priority documents have been received in Application No. 09/210,759.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
     \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/5/04, 2/5/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 13-16, 19-23, 26-29, and 32-41 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on April 5, 2006.

### ***Specification***

2. The disclosure is objected to because of the following informalities: The first paragraph of the specification should be amended to indicate the U.S. Patent No. of the most recent parent application 10/421,839.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, line 6, the phrase “gelling the substrate...” is vague and indefinite because it is not clear how the substrate is gelled. It appears that the claim should read --gelling the coating liquid-- instead of “gelling the substrate”.

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In claim 9, lines 3-4, the phrase “up to before exposing the substrate to a gas after carrying the substrate into a sealed chamber” is vague and indefinite because it is not clear what is required by this limitation. Claim 1 requires that the substrate is carried into the sealed chamber *while* exposing the substrate to a gas, which appears to contradict this limitation in claim 9.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US 6,130,152).

Smith et al. discloses a method of forming a film comprising: a coating step of forming a film by coating a coating liquid, in which particles or colloids of TEOS are dispersed in a mixture of a first solvent and a second solvent (ethanol as the first solvent, and 1-butanol and water as the second solvent) on a surface of a substrate (col. 5, lines 13-24); a gelling step of gelling the coating liquid in a state where the inside of a sealed chamber is filled by a gas containing the second solvent vapor of the coating liquid (1-butanol and water) in high, saturated concentrations; and then a step of drying where the inside of the sealed chamber is filled by a gas containing the second solvent vapor of the coating liquid (1-butanol and water) in a lower concentration such the second solvent is dried from the coating liquid on the substrate (col. 5).

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Smith et al. teaches slow drying of the film in a controlled atmosphere in col. 5, lines 53-54. It is known that in order to perform slow drying of the film (by evaporation of the second solvent), the concentration of the second solvent vapor in the atmosphere must be lower than a saturated concentration. It is noted that claim 1 does not require an order of its steps, thus the second claimed gelling step is performed prior to the first claimed gelling step in Smith et al.

While Smith et al. does not teach its first gelling step is performed together with carrying the substrate into a sealed chamber, it is noted that Smith et al. teaches that coating and gelation need not be performed in the same chamber or even in the same atmosphere in col. 5, lines 62-63.

As to claim 2, Smith et al. does not teach use of elevated temperatures, therefore it would have been obvious to one having ordinary skill in the art to have introduced a gas having a temperature close to that inside the sealed chamber, i.e., at room temperature.

As to claim 3, Smith et al. does not teach the specifics of the apparatus used to generate and exhaust the mixed gas atmosphere, or the means used to generate solvent vapor. However it is well known in the art to use a valve to switch between exhausting gas and introducing gas into a sealed chamber. Further, it is well known to incorporate a vaporizer to vaporize solvent liquid. It would have been obvious for an engineer skilled in the art to have used such a valve configuration and/or vaporizer with the expectation of successful results since such is very well known in the absence of a showing of criticality.

As to claim 4, while Smith et al. does not disclose a step of heating, it is well known in the art that heating may be conducted during gelling in order to expedite the gelling process. It

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would have been obvious to one having ordinary skill in the art to have performed heating in order to increase the rate of gelling.

As to claim 5, it is the Examiner's position that it would have been obvious to a skilled engineer to have controlled the flow rate of at least one of the carrier gas or the vapor of the solvent component in order to carefully control the mixture that is introduced into the chamber during drying.

As to claims 7-8, it would have been obvious to have continuously varied the concentration of the second solvent vapor in the atmosphere during the drying step in order to increase or decrease the rate of evaporation of second solvent to optimize drying times and coating characteristics.

#### ***Allowable Subject Matter***

7. Claim 10 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The prior art does not teach or fairly suggest the claimed coating and gelling process, including a first gelling step where the first average concentration corresponds to a saturated vapor pressure at a substrate temperature during transfer into a chamber, and a second gelling step where the second average concentration corresponds to a saturated vapor pressure at a substrate temperature during gelling.

#### ***Conclusion***

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8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gnade et al. (US 5,561,318) is cited for its teaching of performing gelation in a saturated solvent atmosphere and controlling gelling conditions in order to vary porosity of the deposited layer(s). Mandal et al. (US 5,670,210) is cited for its teaching of an apparatus that is capable of controlling the atmosphere around a coated substrate, including adjusting the amount of solvent vapor in the atmosphere. However, it is noted that Mandal et al. is directed to applying photoresist solutions which do not undergo gelling.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C. Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Wednesday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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A handwritten signature in black ink, reading "Kirsten C. Jolley". The signature is written in a cursive, flowing style.

Kirsten C Jolley  
Primary Examiner  
Art Unit 1762

kcj